

AMENDMENTS TO THE CLAIMS:

This listing of the claims will replace all prior listings and versions of claims in the application.

Claim 1 (original) A method for detecting the presence of a target nucleic acid comprising:
a) cleaving an invasive cleavage structure, said invasive cleavage structure comprising an RNA target nucleic acid; and
b) detecting the cleavage of said invasive cleavage structure.

Claim 2 (original) The method of Claim 1, wherein cleaving is carried out by a cleavage agent.

Claim 3 (original) The method of Claim 1, wherein said target nucleic acid comprises a first region and a second region, said second region downstream of and contiguous to said first region.

Claim 4 (original) The method of Claim 3, wherein said invasive cleavage structure comprises said target nucleic acid, a first oligonucleotide, and a second oligonucleotide, wherein at least a portion of said first oligonucleotide is completely complementary to said first region of said first target nucleic acid, and wherein said second oligonucleotide comprises a 3' portion and a 5' portion, wherein said 5' portion is completely complementary to said second region of said target nucleic acid.

Claim 5 (original) The method of Claim 4, wherein at least said portion of said first oligonucleotide is annealed to said first region of said target nucleic acid and wherein at least said 5' portion of said second oligonucleotide is annealed to said second region of said target nucleic.

Claim 6 (original) The method of Claim 1, wherein said cleaving generates a non-target cleavage product.

Claim 7 (original) The method of Claim 6, wherein said detecting the cleavage of said invasive cleavage structure comprises detecting said non-target cleavage product.

Claim 8 (original) The method of Claim 4, wherein said 3' portion of said second oligonucleotide comprises a 3' terminal nucleotide not complementary to said target nucleic acid.

Claim 9 (original) The method of Claim 4, wherein said 3' portion of said second oligonucleotide consists of a single nucleotide not complementary to said target nucleic acid.

Claim 10 (original) The method of Claim 1, wherein said detecting the cleavage of said invasive cleavage structure comprises detection of fluorescence.

Claim 11 (original) The method of Claim 1, wherein said detecting the cleavage of said invasive cleavage structure comprises detection of mass.

Claim 12 (original) The method of Claim 1, wherein said detecting the cleavage of said invasive cleavage structure comprises detection of fluorescence energy transfer.

Claim 13 (original) The method of Claim 1, wherein said detecting the cleavage of said cleavage structure comprises detection selected from the group consisting of detection of radioactivity, luminescence, phosphorescence, fluorescence polarization, and charge.

Claim 14 (original) The method of Claim 4, wherein said first oligonucleotide is attached to a solid support.

Claim 15 (original) The method of Claim 4, wherein said second oligonucleotide is attached to a solid support.

Claim 16 (original) The method of Claim 2, wherein said cleavage agent comprises a structure-specific nuclease.

Claim 17 (original) The method of Claim 16, wherein said structure-specific nuclease comprises a thermostable structure-specific nuclease.

Claim 18 (original) The method of Claim 2, wherein said cleavage agent comprises an enzyme, wherein said enzyme comprises a heterologous functional domain, wherein said heterologous functional domain provides altered functionality in a nucleic acid cleavage assay.

Claim 19 (original) The method of Claim 18, wherein said enzyme comprises a 5' nuclease.

Claim 20 (original) The method of Claim 19, wherein said 5' nuclease comprises a thermostable 5' nuclease.

Claim 21 (original) The method of Claim 18, wherein said enzyme comprises a polymerase.

Claim 22 (original) The method of Claim 21, wherein said polymerase is altered in sequence relative to a naturally occurring sequence of a polymerase such that it exhibits reduced DNA synthetic activity from that of the naturally occurring polymerase.

Claim 23 (original) The method of Claim 21, wherein said polymerase comprises a thermostable polymerase.

Claim 24 (original) The method of Claim 23, wherein said thermostable polymerase comprises a polymerase from a *Thermus* species.

Claim 25 (original) The method of Claim 23, wherein said *Thermus* species is selected from *Thermus aquaticus*, *Thermus flavus*, *Thermus thermophilus*, *Thermus filiformis*, and *Thermus scotoductus*.

Claim 26 (original) The method of Claim 18, wherein said heterologous functional domain comprises an amino acid sequence that provides an improved nuclease activity in said nucleic acid cleavage assay.

Claim 27 (original) The method of Claim 18, wherein said heterologous functional domain comprises an amino acid sequence that provides an improved substrate binding activity in said nucleic acid cleavage assay.

Claim 28 (original) The method of Claim 18, wherein said heterologous functional domain comprises an amino acid sequence that provides improved background specificity in said nucleic acid cleavage assay.

Claim 29 (original) The method of Claim 18, wherein said heterologous functional domain comprises two or more amino acids from a polymerase domain of a polymerase.

Claim 30 (original) The method of Claim 29, wherein at least one of said two or more amino acids is from a palm region of said polymerase domain.

Claim 31 (original) The method of Claim 29, wherein at least one of said two or more amino acids is from a thumb region of said polymerase domain.

Claim 32 (original) The method of Claim 29, wherein said polymerase comprises *Thermus thermophilus* polymerase.

Claim 33 (original) The method of Claim 29, wherein said two or more amino acids from said polymerase domain comprise two or more amino acids from amino acids 300-650 of SEQ ID NO:1.

Claims 34-35 (canceled)

Claim 36 (currently amended) The method of ~~Claim 8~~ Claim 6, further comprising the steps of forming a second invasive cleavage structure comprising said non-target cleavage product and cleaving said second invasive cleavage structure.

Claims 37-40 (canceled)

Claim 41 (original) The method of Claim 3, wherein a portion of said target nucleic acid consisting of said first region and said second region of said target nucleic acid comprises a splice junction.

Claim 42 (original) The method of Claim 3, wherein said first region or said second region of said target nucleic acid comprises an exon.

Claim 43 (original) The method of Claim 3, wherein said first region or said second region of said target nucleic acid comprises an intron.

Claim 44 (original) The method of Claim 1, wherein said RNA target nucleic acid is provided in a cell lysate.

Claim 45 (currently amended) The method of ~~Claim 6~~ Claim 4, wherein said first oligonucleotide is covalently attached to said second oligonucleotide.

Claims 46-49 (canceled)